



Press Overview Technology

Technology Overview

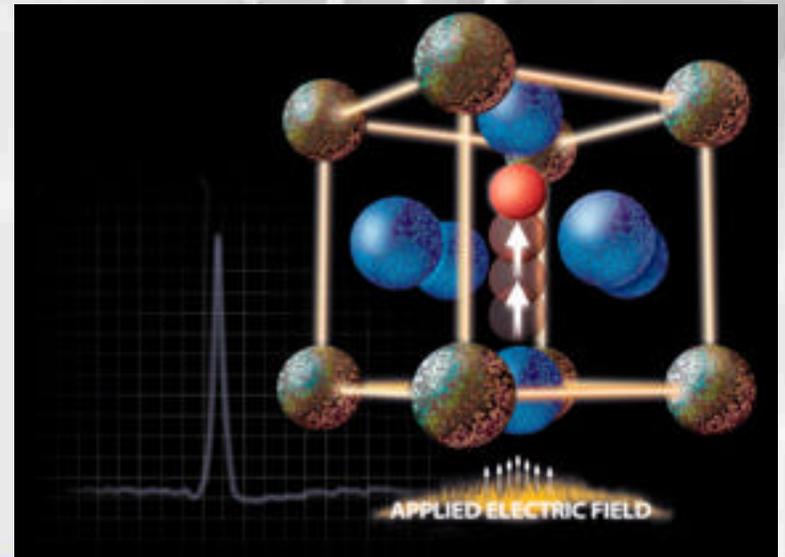
FRAM is Ferroelectric RAM

**True nonvolatile RAM, no
backup battery**

FRAM Memory

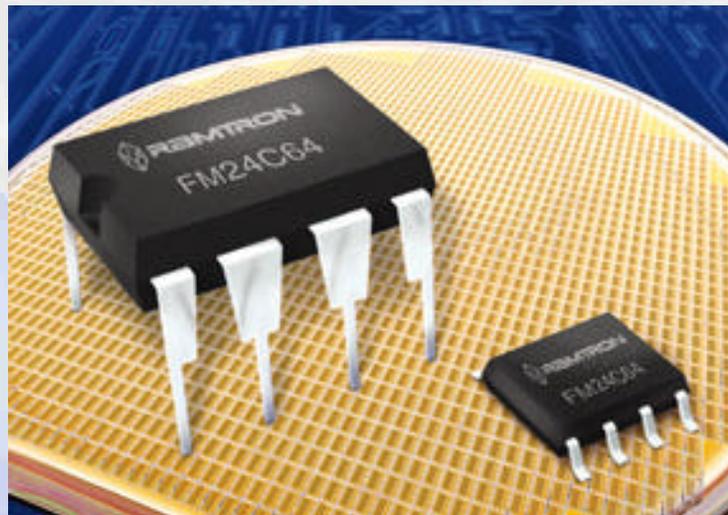
EEPROM
FLASH
EPROM
ROM

- ◆ Ferroelectric crystals provide the basic memory element
- ◆ Data is stored by a mobile atom with 2 stable states
- ◆ The mobile atom is stable in the absence of power

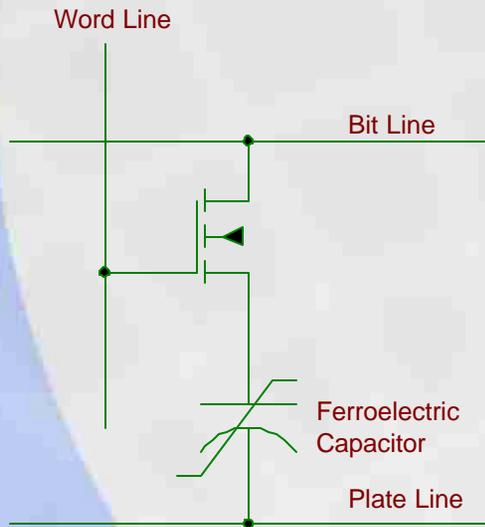


Technology Advantages

- ◆ **Fast Write** – Atom moves very quickly, no physical barrier. FRAM writes in 70 ns versus 10 ms for EEPROM.
- ◆ **High Endurance** – With no physical barrier to wear out, FRAM offers > 10 billion (1E10) writes vs 1 million for EEPROM.
- ◆ **Low Power** – FRAM uses no charge pump or high voltages, so power consumption is much lower.

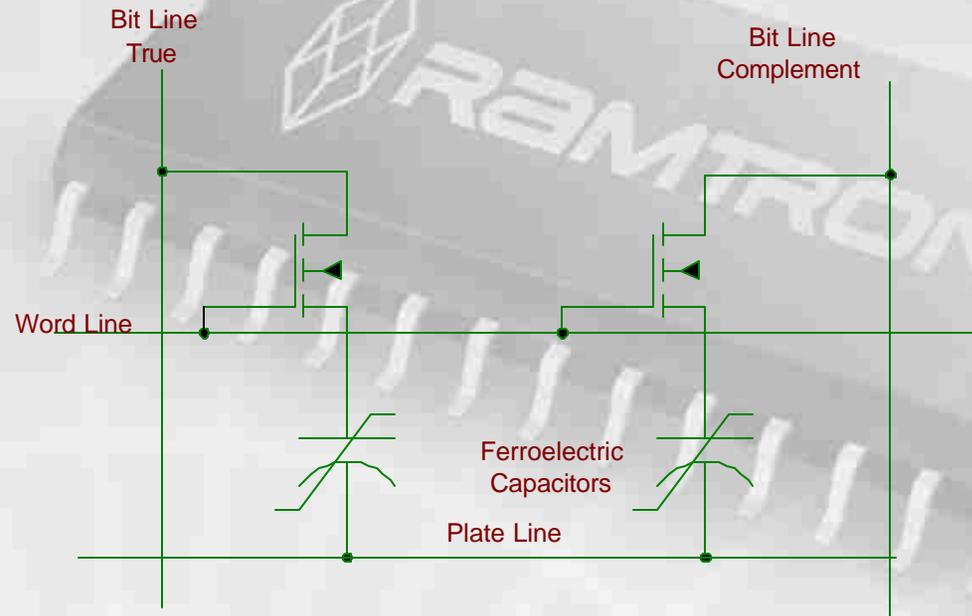


FRAM Memory Cells



1T1C

Ferroelectric signal compared to a reference



2T2C

Ferroelectric signal compared to its complement

Similar to a DRAM Cell